

**IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

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PRINCETON DIGITAL IMAGE CORPORATION,)	
)	
PDIC,)	
)	CASE NO.: 1:12-CV-00779-RJS
v.)	
)	
HEWLETT-PACKARD COMPANY, FUJIFILM)	
NORTH AMERICA CORPORATION F/K/A FUJIFILM)	
U.S.A., INC. AND XEROX INTERNATIONAL)	
PARTNERS,)	
)	
DEFENDANTS.)	
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SUPPLEMENTAL DECLARATION OF VERNON THOMAS RHYNE, III

I, Vernon Thomas Rhyne, III, submit this Supplemental Declaration pursuant to 28 U.S.C. § 1746 and declare as follows:

1. INTRODUCTION, BACKGROUND AND EXPERTISE, AND INFORMATION CONSIDERED

1. My name is Vernon Thomas Rhyne, III, and I reside at 8407 Horse Mountain Cove, Austin, TX 78759-6828. I am an independent consultant. I have prepared this Supplemental Declaration at the request of Princeton Digital Image Corporation (“Plaintiff” or “PDIC” herein) in this action for consideration by this Court, the United States District Court for the Southern District of New York. I submit this Supplemental Declaration in support of PDIC’s Responsive Claim Construction Brief. I am over eighteen years of age and I would otherwise be competent to testify as to the matters set forth herein if I am called upon to do so.

2. This Supplemental Declaration has been prepared in response to the opinions offered by an expert for the defendants in the **AUGUST 19, 2013 DECLARATION OF DR. TOURADJ EBRAHIMI REGARDING U.S. PATENT NOS. 4,813,056 AND 4,860,103** (the “Ebrahimi Declaration” herein). However, in this Supplemental Declaration I only address Dr. Ebrahimi’s opinions regarding the asserted claims of U.S. Patent No. 4,860,103 (“the ’103 Patent” herein).

3. In forming my opinions as set forth in this Supplemental Declaration, I have studied the Ebrahimi Declaration in detail. I have also relied on my knowledge and experience in the field and on the documents and information referenced herein.

4. I provided a summary of my qualification to offer technical opinions in this litigation in ¶¶ 3 to 5 of my prior declaration dated August 19, 2013. I provided additional details of my education and work experience are set forth in my Curriculum Vitae, which was attached as **Appendix A** to my Prior Declaration. That appendix also contained a list of my publications and a table listing my testimony at trial, hearing, or deposition during the past four years. Since that list was provided I have been deposed in the following litigations:

- Walker Digital LLC v. Activision Blizzard, Inc., *et al.* (Civil Action No. 11-cv-322-SLR) in the District of Delaware on June 6, 2013.
- Amit Jaipuria and Pradeep Jaipuria v. LinkedIn Corp. and Hoover’s Inc., (Civil Action No. 6:11-cv-00066) in the Eastern District of Texas on July 18, 2013.¹
- TQP v. 1-800-Flowers.com, Inc., *et al.*, (Civil Action No. 2:11-CV-248-JRG-RSP) in the Eastern District of Texas on August 20, 2013.

¹ This deposition was mistakenly listed as taking place on June 17, 2013 in the last row of the table of prior testimony provided in **Appendix A** to my Prior Declaration.

5. The following depositions were also inadvertently left off of the table I provided in my Prior Declaration:

- An earlier deposition re the Jaipuria v. LinkedIn Corp. and Hoover's Inc. litigation that took place on October 2, 2012.
- An earlier deposition re the Suffolk Technologies LLC v. AOL Inc. and Google Inc. litigation that took place on December 13-14, 2012.

6. As I explained in my prior Declaration, I have been retained by PDIC as an expert in this case. I am being compensated for my work on this case at \$650 per hour. No part of my compensation is dependent upon the outcome of this case or any issue in it.

7. In forming the opinions set forth in this Supplemental Declaration, in addition to my knowledge and experience, I have considered the following documents and things:

- The Ebrahimi Declaration,
- The '103 Patent and its file history,
- The Reexamination file history of the '103 Patent, and,
- The **JOINT CLAIM CONSTRUCTION AND PREHEARING STATEMENT** dated July 12, 2013.

2. MY OPINIONS

8. Dr. Ebrahimi provides his opinions regarding the constructions of certain terms from claims 1 and 11 of the '103 Patent in the Ebrahimi Declaration. Among those opinions is the following:

18. After reading the '103 patent and its prosecution history, it is my opinion that a person of ordinary skill in the art in the 1985-89 time frame would have been an engineer having a masters degree in electrical engineering plus at least two years of experience in the field of signal processing.

9. I find the level of "ordinary" skill set forth by Dr. Ebrahimi to be unusually high given the art of the '103 Patent. I am quite familiar with the coursework and laboratory experience to be expected of both a bachelor's and master's graduate in the U.S. in the 1986 time frame based on my own academic experience and my years of volunteer work within the U.S Accreditation Board for Engineering and Technology. That body provides accreditation services for both undergraduate and graduate engineering and computer science programs that are offered in the U.S., as well as limited accreditation for international programs in those areas. Given my experience with both bachelor's and master's programs in electrical engineering here in the U.S., I see nothing about the technical areas addressed by the '103 Patent that requires university study beyond that found in a typical U.S. undergraduate program in that field.

10. For reference the FIELD OF THE INVENTION is set forth at 1:8-10 of the '103 specification as “[t]he present invention concerns video signal processing, and more particularly to the conversion of such signals into digital form.” The technology of analog-to-digital conversion as identified in that statement was commonly taught in the second or third years of a U.S. electrical engineering program.

11. I provided my own opinion regarding the education and experience to be expected of those of ordinary skill in the art of the '103 Patent in ¶ 6 of my Prior Declaration. For reference, my proposed opinion regarding ordinary skill in that art is:

... a person having ordinary skill in the art (“PHOSITA”) ... in my opinion, would have at least an accredited bachelor’s degree in electrical or computer engineering or equivalent discipline, or at least two years professional experience in such a field.

12. I note here, however, that while I disagree with Dr. Ebrahimi’s opinion regarding a person having ordinary skill in the art of the '103 Patent, the differences between his opinion and my own are not so significant as to materially affect my opinions regarding the proper construction of the “control means” limitations of claims 1 and 11 of that patent. For reference, those two limitations are:

[1] “control means responsive to the digital words at the output of the converter to generate digitally, as a function of the average amplitude level represented by previous said digital words at the converter output, a control signal for application to the control input of the converter”

and:

[11] “control means responsive to the digital words at the output of the converter to generate digitally, as an arithmetic function of the amplitudes represented by the digital words at the converter output, a control signal for application to the control input of the converter for controlling the average level represented by said digital words by maintaining the average level of said digital words within a predetermined range”

13. Dr. Ebrahimi provided his opinions regarding the “Claim Construction Issues for the '103 Patent” in ¶¶ 19 to 29 of the Ebrahimi Declaration, focusing his discussion on the two “control means” limitations shown above. As I explain below, I have found much in that section of his declaration that I disagree with. In ¶ 22, for example, he begins his discussion of those limitations by opining that:

In my expert opinion, to a person of ordinary skill in the art, the ‘control means’ phrases in claim 1 and claim 11 do not recite any structure for performing the functions identified by the parties. A “control means” does not have an established meaning to a person of ordinary skill in the art. This can be contrasted with a person of ordinary skill in the art of television repair, where there is an established meaning for a device called “remote control.” To a person of ordinary skill in the art here, “control means” would imply some kind of device or mechanism that controls, but that is vague if not meaningless and, in any event, insufficient to perform the recited function. The rest of the phrase does not recite any structure to a person of ordinary skill in the art. It merely recites certain functions performed by the control means.

14. Here I first note that, in my opinion, should the Court find that the “control means” limitations of claims 1 and 11 are means-plus-function claim terms, I do not believe that the functions proposed by Defendants for those limitations are correct. See ¶¶ 22 and 23 of my prior Declaration. There, I explained my opinion that a person of ordinary skill in the art of the ’103 Patent:

... would understand that the limitation “responsive to the digital words at the output of the converter” describes a structural relationship between the input to the “control means” and the output of the claimed analog-to-digital converter and is part of the algorithm executed by the “control means” itself.

and

... would also understand in view of the plain language of claim 11 and the specification that the limitation “for controlling the average level represented by said digital words by maintaining the average level of said digital words within a predetermined range” has nothing to do with generating the control signal, but instead describes what is done with the control signal after it is generated.

15. Further, with respect to the “phrases in claims 1 and 11” as addressed by Dr. Ebrahimi in the above citation, it appears that he was considering only the two-word phrase “control means” in making that statement. I find that opinion, if I have properly understood it, to be far off target. What is important when determining whether or not the “control means” limitations of claims 1 and 11 should be subject to 35 U.S.C. § 112 ¶ 6, is whether or not the entirety of those limitations identifies sufficient structure to remove those elements from the ambit of that part of 35 U.S.C., and not just the two-word term “control means” found at the beginning of each of those limitations. As explained in ¶ 13 of my Prior Declaration:

... it is my opinion that these two “control means” terms should not be construed as means plus function elements because claims 1 and 11 connote sufficient structure or material for performing the recited functions of these claim terms.

I explained the bases for that opinion in detail in ¶¶ 14 to 19 of that Declaration. I address that issue again below.

16. Also, I disagree with Dr. Ebrahimi’s opinion, as expressed in ¶ 22 of the Ebrahimi Declaration that the term “control means” is “vague, if not meaningless.” Rather, as I explained in ¶ 15 of my Prior Declaration, it is my opinion that a person of ordinary skill in the art of the ’103 patent:

... would understand that the “control” term found in the “control means” and its recited function of “to generate digitally...a control signal for application to a control input of the converter,” connote the structure of a specialized controller that is operatively connected to a control input of an analog-to-digital converter in order to generate a digital output for controlling that converter.

17. I also find Dr. Ebrahimi’s comparison between the “control means” of claims 1 and 11 and the “remote control of a television set” (I don’t understand his reference to “television repair”) to be misdirected. As I explained in my prior Declaration and explain again below, the “control means”

limitations of claims 1 and 11 – in and of themselves – describe in sufficient detail the structure of the “control means” of each of those claims, and neither has anything to do with a television. Whether the “control means” claim limitations recite sufficient structure for performing their recited function to one of ordinary skill in the art of the ’103 Patent has absolutely nothing to do with television.

18. As shown above, Dr. Ebrahimi concludes ¶ 22 by referring to “the rest of the phrase” of the “control means” limitations of claims 1 and 11. Here, I believe Dr. Ebrahimi is referring to the words which follow the words “control means” in the applicable limitations of claims 1 and 11. If I am correct in that understanding, I disagree with his statement that those additional words “do[] not recite any structure” and recite only “functions to be performed by the control means.” In fact, using claim 1 as an example, the “control means” limitation refers to receiving “the output of the converter” (specifying an input structure supplying digital data to that means through a connection to the analog-to-digital converter); to generating digitally a control signal for application to the control input of the converter (specifying an output structure that supplies digitally generated data feeding back from that means to the same analog-to-digital converter), and to a digital data processing structure that can calculate an average amplitude level for the data received by that means. Further, when read in the light of the specification of the ’103 Patent, including Figure 1 and its explanation in the patent’s written description, it is my opinion that the nature of the structures of the “control means” limitations of claims 1 and 11 becomes even clearer, something I explained in my Prior Declaration and explain again later in this Supplemental Declaration.

19. In ¶ 23 of his declaration Dr. Ebrahimi goes on to opine that:

23. The specification of the ’103 patent states that controller 10 could be a microprocessor 11 with associated data bus 12 and memories, buses and latches. ’103 Patent at 2:1-8. The specification also states that the controller could be a single-chip microcomputer. ’103 Patent at 2:8-9. These are generic processing devices that require programming. They will not perform the claimed function without being programmed with a specific algorithm.

20. I agree with much of this paragraph of Dr. Ebrahimi’s opinion. As I noted above, the language of the “control means” limitations of claims 1 and 11, in and of itself, identifies a digital controller that received digital data from an analog-to-digital converter and digitally generates a feedback signal which is sent back to that same converter. Thus, the controller is a digital device that can calculate an average value given its digital input data. As those of ordinary skill in the art of the ’103 Patent would have known as of 1986, such a digital device could be constructed as a hard-wired digital “Application-Specific Integrated Circuit” or, alternatively, by programming a microprocessor to calculate the average value of those digital data in order to digitally generate the feedback signal. As Dr. Ebrahimi noted, the

use of a properly programmed “single-chip microcomputer” as the “control means” of claims 1 and 11 was clearly disclosed in the ’103 specification.

21. Where Dr. Ebrahimi and I disagree, however, is whether or not the language of the two “control means” limitations provides sufficient disclosure of what that programming should be. He opines that it does not. I am of the opinion that it does, an opinion I explained in ¶ 17 of my Prior Declaration:

It is also my opinion that a PHOSITA² would understand that the language of claims 1 and 11 themselves fully sets forth the algorithm for performing the recited function and that the claimed algorithm is (a) an averaging operation and/or (b) an arithmetic function that determines the average level of the digital words applied to the input to that function (the digital words representing various amplitude levels produced by the analog-to-converter) in order to derive the output of the specified algorithm (the control signal sent to that converter).

22. I explained that opinion further in ¶ 19 of my prior Declaration:

The computational nature of the averaging and the arithmetic functions of claims 1 and 11 were well understood mathematical operations to a PHOSITA at the time of the invention of the ’103 Patent, and a PHOSITA would know how to use an averaging function or arithmetic function to perform the recited function of the “control means” limitation given that the claim fully sets forth the algorithm and the structure of a specialized controller having a processor to execute such algorithm. For example, the averaging operation of claim 1 typically involves generating the sum of a number of digital values and dividing that sum by the number of the summed values. Similarly, an arithmetic function such as that of claim 11 that is used to “maintain the average of said digital words” will need to compute such an average as part of its controlling operation.

23. In ¶ 24 of his declaration Dr. Ebrahimi goes on to opine that:

24. The ’103 Patent discloses a single algorithm for performing the claimed function. The algorithm is illustrated in Figure 3 and discussed at column 2 line 32 to column 3 line 9. One of ordinary skill in the art would understand that the entire algorithm was necessary to perform the recited function. There is only one entry point into the algorithm, labeled “START” and leading to step 1. The control signal is adjusted from either step 15 (a normal adjustment) or step 19 (to avoid lockup) and control is returned to step 1. One of ordinary skill in the art would understand this as a closed-loop algorithm. There is no disclosure in the ’103 Patent to a person of ordinary skill in the art that this algorithm could be “partially” executed or broken into separately executable subparts.

24. Here, too, there is much that I disagree with. First, as I explained in my prior Declaration, the specification of the ’103 Patent discloses not just “a single algorithm” as Dr. Ebrahimi asserts, but rather identifies *nine* algorithms which I listed as (a) through (i) in ¶ 29 of that Declaration.

² “PHOSITA” is an acronym I used in my prior Declaration for a “Person Having Ordinary Skill In The Art” of the ’103 Patent.

25. Second, Dr. Ebrahimi's assertion that "the entire algorithm" disclosed in Figure 3 of the '103 patent must be used to perform the function of the "control means" limitations of claims 1 and 11 is wrong. As I explained in my prior Declaration, the only steps from Figure 3 that are clearly linked to the performance of those two limitations are Steps 12 and 13, the steps which accumulate a total value for a specific number of digital values ("samples") received by the "control means" from the ADC's of those two claims, a value which identifies the average value of that set of values. The other steps shown in Figure 3 are not needed to accomplish that averaging operation.

26. What Dr. Ebrahimi has failed to recognize is that the claims of the '103 Patent are arranged in a manner which allocates different portions of the algorithm disclosed in the flowchart of Figure 3 to different claims, an arrangement which is explained in the '103 specification at 1:25-26 ("Other optional features are defined in claims 2 to 9 of the appended claims."). Thus, while claims 1 and 11 deal only with the averaging operation performed by Steps 12 and 13 of that figure, the dependent claims recite other optional operations performed by the other steps in Figure 3. For example, claim 5 addresses Step 6 alone, claim 6 addresses Step 9, claim 7 addresses Steps 16 and 18, and claim 4 addresses Step 14. Clearly, Dr. Ebrahimi has failed to understand the manner in which the claims of the '103 Patent begin with a broad independent claim (claim 1) which recites only a portion of the algorithm of Figure 3 (Steps 12 and 13), and then moves on to dependent claims which recite further portions of that algorithm (Steps 5, 6, 9, 11, 14, 16 and 18, for example) Dr. Ebrahimi is wrong when he opines that the "entire algorithm" of Figure 3 "was necessary to perform the recited function[s]" of the "control means" limitations of claims 1 and 11.

27. As to Dr. Ebrahimi's opinion that "[t]here is no disclosure in the '103 Patent to a person of ordinary skill in the art that this algorithm could be "partially" executed or broken into separately executable subparts," he is incorrect there, as well. First, Dr. Ebrahimi contradicts that statement with his own statement in the fifth sentence of the same paragraph when he appears to admit that a person of ordinary skill in the art would understand that at least two different algorithmic paths (capable of being executed independently – *i.e.*, without executing the other) are disclosed in Fig. 3 by stating that "the control signal is adjusted from *either* step 15 (a normal adjustment) or step 19 (to avoid lockup)." (emphasis added). Second, as I noted above, at 1:25-26 the '103 specification states that "[o]ther optional features are defined in claims 2 to 9 of the appended claims." That statement clearly shows that "optional features" such as the omission of certain sample values from the averaging process of claim 1 or comparing samples to upper and lower thresholds are distributed across claims 2 to 9,

and the language of those claims clearly breaks the algorithm of Figure 3 “into separable executable parts” as I explained in the preceding paragraph.”

28. Dr. Ebrahimi expands on his opinion that the entire algorithm of Figure 3 is “necessary” in ¶ 25 of the Ebrahimi Declaration where he points to statements made in the ’103 specification at 3:10-13 regarding the processing capabilities of a “typical system” in the 1986 time-frame. There, too, he has failed to recognize the manner in which the claims of the ’103 Patent move from a broad independent claim which addresses only the averaging process to narrower dependent claims which bring in limitations that address the utility of averaging only a subset of the total set of samples produced by the ADC. It is my understanding as a patent agent that a patentee need not address all of the aspects of his or her invention in each and every claim, but, rather, is free to define a broad independent claim which addresses only a specific aspect of that invention, and then to use dependent claims to address further aspects of that invention, and that is exactly what is done in the ’103 Patent.

29. Continuing in ¶ 26 of his Declaration, Dr. Ebrahimi opines that:

Defendants identify the structure for the control means in both claims 1 and 11 as “a controller having a processor that executes the algorithm of Figure 3 and accompanying text in Column 2, lines 32-68 to Column 3, lines 1-9.” As explained above, in my expert opinion, a person of ordinary skill in the art would have understood that structure to perform the claimed function, as necessary to perform the claimed function, and as clearly identified by the specification as performing the claimed function.

30. Here Dr. Ebrahimi has simply endorsed Defendants’ position that if the Court determines that the “control means” limitations of claims 1 and 11 are means-plus-function limitations having a programmable controller as their corresponding structure, that controller must implement the entirety of the algorithm shown in Figure 3 of that patent. I disagree with that position as I explained in my Prior Declaration and in ¶¶ 25 to 28 above.

31. In ¶ 27 of his Declaration, Dr. Ebrahimi next cites to the structure that both PDIC and I have identified as the corresponding structure of the “control means” limitations of claims 1 and 11 should the Court decide that those limitations are subject to 35 U.S.C. § 112 ¶ 6, that structure being identified as “a controller 10 having a processor 11 that partially executes the algorithm shown and described in the Abstract, Col. 1, ll. 19-24, Col. 2, ll 19-22 and ll. 28-30 and in Fig. 3 (steps 12, 13) and the accompanying text, and statutory equivalents thereof.” See **JOINT CLAIM CONSTRUCTION AND PREHEARING STATEMENT** at pages 5 and 11 and ¶ 26 of my prior Declaration. He then opines that:

In my expert opinion, a person of ordinary skill in the art would have understood [a] that structure to not be sufficient to perform the claimed function, and would have understood that [b] the specification did not clearly identify that structure as performing the function.

32. With respect to his assertion [a] as marked above, I explained that Steps 12 and 13 of the algorithm disclosed in Figure 3 of the '103 Patent and the accompanying text from the '103 specification were sufficient to perform the functions of the “control means” of claims 1 and 11 both in my Prior Declaration and in ¶¶ 25 to 28 above. As Dr. Ebrahimi's assertion [b], at 2:64-66 the '103 specification identifies Steps 12 and 13 as being the steps for computing the average of a set of sample values:

12 The sample is added to an accumulator.

13 If the in-range sample count has not reached 100, return for a further sample.

Here, by accumulating the values of exactly 100 samples, a value representing the average of those 100 samples is determined, and that is sufficient to perform the functions set forth in the “control means” limitations of claims 1 and 11.

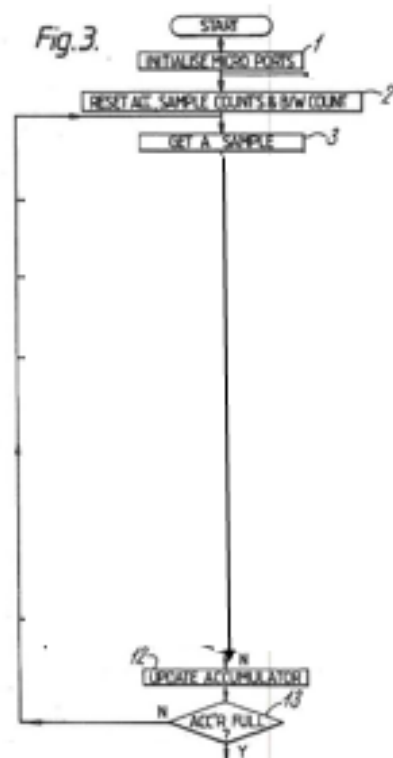
33. I explained that approach to determining the average or “mean” value for a set of samples as shown in Steps 12 and 13 further in ¶ 32 of my Prior Declaration:

It was well understood to persons skilled in the art at the time of the '103 Patent that simply accumulating a predetermined number of values can provide an average of the values of the sample set because it is well understood that both an accumulated sum of a predetermined number of values (i.e., an accumulation having a known, fixed sample set size), a process which omits the step of dividing the accumulated value by the number of values that is already known, provides the information about the average value just as that provided by an accumulated sum divided by a number of values that is not known in advance.

34. Continuing his criticism of the structure identified by myself and PDIC, on ¶ 28 of his declaration Dr. Ebrahimi opines that:

... it is not clear what PDIC means by “partially executes” followed by five citations to the '103 Patent, especially because each of the citations refers to multiple functions. It is not clear whether PDIC means that the controller only executes some unidentified subset of the material found in the cited five passages, or that the controller must execute all of the material found in the cited five passages and by doing so “partially executes” something else.

35. Here, I find it difficult to see what is unclear about the “partially executes” language since the identified structure includes only Steps 12 and 13 of Figure 3, thereby omitting the other steps of that figure which are addressed by claims 2 to 9. That “partial execution” modifies the algorithm shown in Figure 3 to appear as shown below:



36. As shown above, only Steps 12 and 13 are needed to determine the average of the samples which are summed in the disclosed accumulator.

37. Dr. Ebrahimi's criticism continues in ¶ 29 of his Declaration:

29. PDIC identifies the Abstract, but the abstract does not recite an algorithm. It speaks generally of functions that are performed by the algorithm (e.g., irregular subsampling and lockup avoidance) but does not provide an algorithm for actually executing those functions by the processor. Column 1, lines 19-24 merely rephrases the claimed function without providing an algorithm. Column 2, lines 19-22, 28-30 does not recite an algorithm either, but merely restates "[t]he function of the controller" and describes the "aim" of the function. Finally, PDIC identifies Fig. 3 (steps 12, 13) and the accompanying text. A person of ordinary skill in the art would not understand steps 12 and 13 to be capable of "partial execution." There is no disclosure in the '103 patent of any such partial execution. As discussed above, the specification makes clear that the entire algorithm is necessary.

38. In response, I first note that the Abstract of the '103 patent makes clear that the use of "irregular sampling of the digital values" is not a requirement of the claimed invention, thereby showing that claims 1 and 11 need not include the portions of Figure 3 which provide that form of sampling. See lines 5 to 8 of that Abstract (emphasis added):

Preferably the controller employs an irregular subsampling of the digital values, and responds differently to extreme and mid-range samples

39. Further, I explained my differences with the opinion stated in the last two sentences of Dr. Ebrahimi's ¶ 29 both in my Prior Declaration and again in this Supplemental Declaration.

40. In sum, therefore, I reiterate my opinions that (a) the "control means" limitations of claims 1 and 11 of the '103 Patent describe sufficient structure to make them not subject to 35 U.S.C. § 112 ¶ 6, and (b) in the event that the Court disagrees with that opinion, the functions set forth in those two limitations should be identified as:

For claim 1:

Function: "generate digitally, as a function of the average amplitude level represented by previous said digital words at the converter output, a control signal for application to the control input of the converter."

Structure: a controller 10 having a processor 11 that partially executes the algorithm shown and described in the Abstract, Col. 1, ll. 19-24, Col. 2, ll 19-22 and ll. 28-30 and in Fig. 3 (steps 12, 13) and the accompanying text, and statutory equivalents thereof.

For claim 11:

Function: "generate digitally, as an arithmetic function of the amplitudes represented by the digital words at the converter output, a control signal for application to the control input of the converter."

Structure: a controller 10 having a processor 11 that partially executes the algorithm shown and described in the Abstract, Col. 1, ll. 19-24, Col. 2, ll 19-22 and ll. 28-30 and in Fig. 3 (steps 12, 13) and the accompanying text, and statutory equivalents thereof.

Executed on September 16, 2013 at Austin, TX.


V. Thomas Rhyne, Ph.D., P.E., R.P.A.